CAREX ASYNCHRONA, A NEW SPECIES OF SECTION *GRISEAE* (CYPERACEAE) FROM TAMAULIPAS, MÉXICO

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ABSTRACT

Carex asynchrona, a new species of section *Griseae*, is described from the Gómez Farías area of southwestern Tamaulipas, México. It differs from its close relatives (*C. hitchcockiana*, *C. impressinervia*, *C. oligocarpa*, and *C. ouachitana*) in that it possesses brown bases, glabrous sheaths, upper 3 – 4 spikes overlapping, and crowded, definitely beaked perigynia. Locally frequent in the upper elevational limit of cloud forest, *C. asynchrona* exemplifies the floristic affinity of the Gómez Farías cloud forest with forests in the southeastern United States.

Carex section *Griseae* (Bailey) Kükenthal (including section *Oligocarpae* (Carey) Mackenzie) is a group of about 16 taxa endemic to eastern North America. Most taxa inhabit mesic deciduous forests and several are widespread and common. The geographic distribution of the section is continuous from Nova Scotia west to Minnesota and south to central peninsular Florida and southern coastal Texas. Recent exploration of the Sierra Madre Oriental in southwestern Tamaulipas, México has resulted in the collection of a distinctive new species of *Carex* section *Griseae*. This new species is disjunct from the rest of the members of the section and is the first documentation of section *Griseae* in México or the tropics.

CAREX **asynchrona** Naczi, sp. nov. (Fig. 1).

Plantae cespitosae; culmi 29 – 79 cm alti; bases culmorum basibus brunneis saepe fibrosis foliorum veterum obtectae. Cataphylla glabra, straminea vel castanea vel atrobrunnea. Folia 6 – 12; laminae 4.7 – 63 cm longae, 1.2 – 4.0 mm latae; vaginae 2.6 – 6.8 cm longae, arctae, glabrae; ligulae 0.9 – 3.2 mm longae. Surculi vegetativi 24 – 49 cm alti; pseudoculmi 2.9 – 8.0 cm alti. Inflorescentiae 6 – 41 cm longae; spicae superae imbricatae; spicae infimae remotae vel vix imbricatae. Spicae 4 – 6, erectae. Spica terminalis 1.4 – 2.7 (3.5) cm longa, 1.5 – 3.7 mm lata, omnino mascula, in pedunculo 2.4 – 10.8 (14.8) mm longo, spicas superas laterales vix superans. Spica infima 1.4 – 3.2 cm longa, 4.3 – 5.8 mm lata, omnino feminea, in pedunculo 2.0 – 15.5 cm longo; flores 10 – 17 spiraliter imbricati, internodium inter flores infimos 1.9 – 3.7 (5.9) mm longum. Spicae laterales 1.0 – 2.4 cm longae, omnino femineae vel androgynae. Squamae femineae 2.5 – 5.9 mm longae, 1.3 – 2.4 mm latae, aristatae; aristae 0.2 – 3.6 mm longae. Perigynia (3.6) 4.0 – 4.7 mm longa, 1.4 – 1.8 mm lata, ascendentia, obscure trigona, glabra, nervata, in rostrum abrupte contracta; nervi 50 – 61 impressi; rostra 0.5 – 1.0 mm

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longa, laevia, plus minusve excurvata, integra. Achenia 2.8 – 3.4 mm longa, 1.4 – 1.6 mm lata, arcte inclusa perigyniis. Stigmata 3, 2.4 – 3.6 mm longa. Antherae 3, (2.1) 2.5 – 2.8 mm longae.

Plants densely to loosely cespitose. Rhizomes short with internodes 0.2 – 3.0 (8.0) mm long, 1.2 – 1.8 mm thick. Roots fibrous, smooth or sparsely covered with root hairs, pale to dark brown. Fertile culms 29 – 79 cm tall, 0.5 – 1.1 mm wide at mid-height, trigonous, erect to spreading, elongating in fruit, antrorsely scabridulous-angled; bases covered by brown, often fibrous bases of old leaves. Cataphylls glabrous, stramineous or red-brown or very dark brown, multicostate. Leaves 6 – 12, all arising in basal 0.1 – 0.5 of culm, the longest half as long as to slightly surpassing culms in fruit; blades 4.7 – 63 cm long, 1.2 – 4.0 mm wide, the widest 2.5 – 4.0 mm wide, flat to barely plicate, glabrous, margins antrorsely scabridulous, adaxial surface antrorsely scabridulous, abaxial surface with elevated veins and smooth or midrib antrorsely scabridulous; leaf sheaths 2.6 – 6.8 cm long, tight, glabrous, green; inner band of sheaths glabrous, hyaline, apex slightly concave and not thickened to slightly thickened; ligules 0.9 – 3.2 mm long, inverted V-shaped with apex acute or lingulate with apex obtuse. Vegetative shoots 24 – 49 cm tall, half as tall as to equalling culms; leaves 7 – 12, similar to those of fertile culms except blades 1.7 – 44 cm long; pseudoculms 2.9 – 8.0 cm tall, 1.3 – 2.1 mm wide. Inflorescences 6 – 41 cm long, 0.1 – 0.8 of culm height, with the upper 3 – 4 spikes overlapping; the uppermost lateral spikes 0.7 – 1.5 (2.2) cm distant; the lowest spikes separate or barely overlapping, 3.7 – 17.9 (23.5) cm distant; lowest bract blade 7.0 – 18.5 cm long, sheath (0.3) 0.7 – 3.1 (6.1) cm long; upper bracts much reduced; uppermost lateral spike bract blade 0.4 – 4.0 cm long, sheath 1.3 – 5.0 mm long, slightly shorter than to slightly exceeding terminal spike; uppermost bract subtending terminal spike and scale-like, sheathless, body 2.7 – 6.3 mm long and awn 2.1 – 6.7 mm long. Spikes 4 – 6, simple, single at nodes, erect. Terminal spike 1.4 – 2.7 (3.5) cm long, 1.5 – 3.7 mm wide, entirely staminate, 54 – 137-flowered, on peduncle 2.4 – 10.8 (14.8) mm long, barely exceeding upper lateral spikes. Lowest spike 1.4 – 3.2 cm long, 4.3 – 5.8 mm wide, entirely pistillate, 10 – 17-flowered, the flowers spirally imbricate, the internode between the lowest flowers 1.9 – 3.7 (5.9) mm long, on peduncle 2.0 – 15.5 cm long. Lateral spikes 1.0 – 2.4 cm long, 4.3 – 7.7 mm wide, entirely pistillate and 7 – 12-flowered or androgynous with 7 – 11 pistillate and 1 – 6 staminate flowers, on peduncles 0.1 – 4.8 cm long. Pistillate scales 2.5 – 5.9 mm long, 1.3 – 2.4 mm wide; body 1.4 – 3.0 mm long and ovate to lanceolate with midrib prolonged as antrorsely scabridulous awn 0.2 – 3.6 mm long, center green

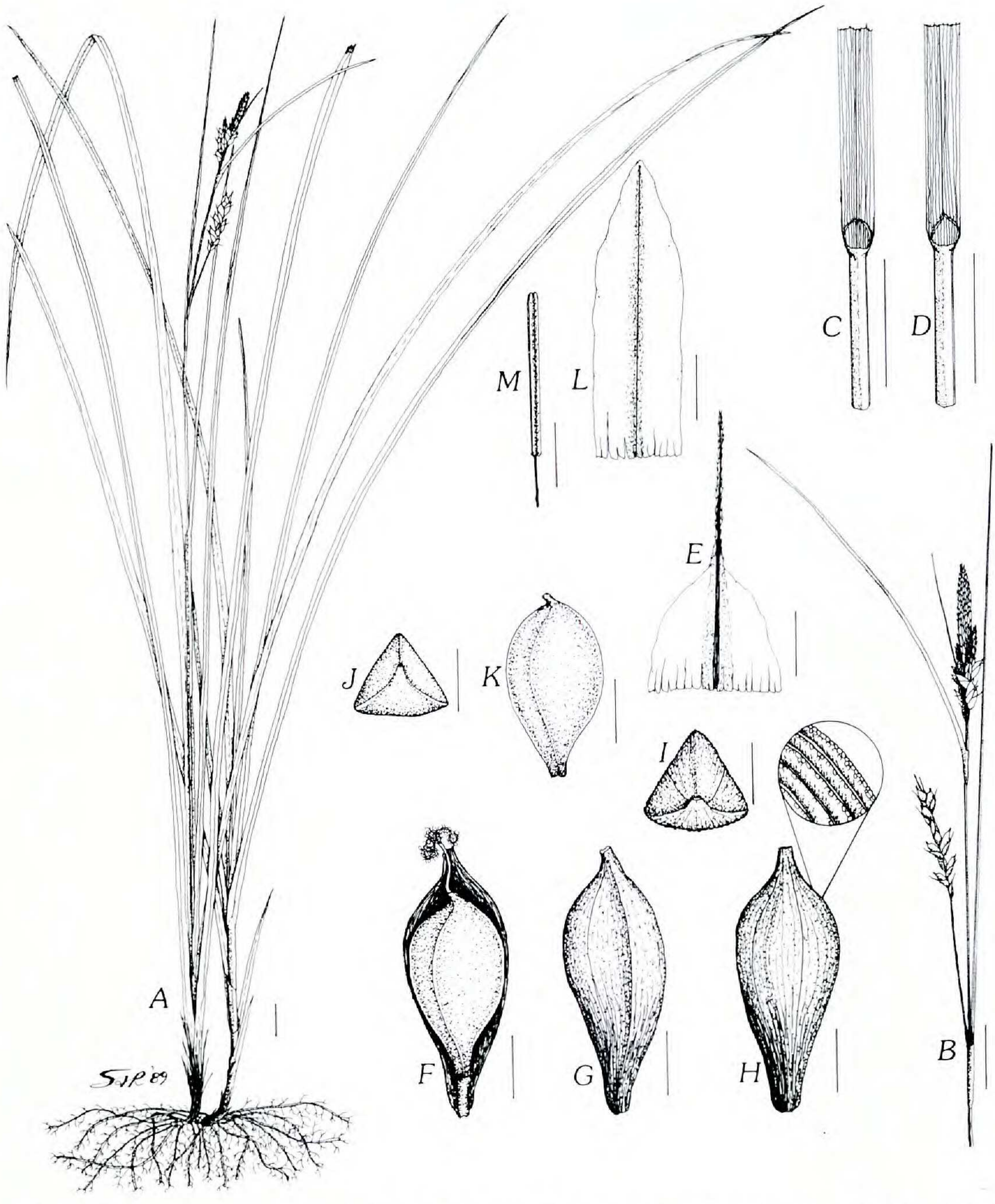

FIG. 1. *Carex asynchrona*. A. Habit. B. Inflorescence. C. Sheath and lingulate ligule. D. Sheath and inverted V-shaped ligule. E. Pistillate scale. F. Perigynium, side view, dissected to reveal achene. G. Perigynium, side view. H. Perigynium, front view, with enlarged portion showing impressed nerves. I. Perigynium, top view. J. Achene, top view. K. Achene, side view. L. Staminate scale. M. Anther. Bar equals 1 cm in A–D and 1 mm in E–M. Drawn by Susan A. Reznicek from the type.

and 2 – 7-veined, margins hyaline and whitish. Staminate scales 3.9 – 7.6 mm long, 1.1 – 1.8 mm wide, oblong, acute to acuminate, awnless, center green and 1 – 3-nerved, margins hyaline and whitish to stramineous. Perigynia (3.6) 4.0 – 4.7 mm long, 1.4 – 1.8 mm wide, 2.4 – 2.9 times as long as wide, ascending, obtusely trigonous with faces flat to slightly convex, with many fine and impressed nerves on each face, the total number of nerves 50 – 61, glabrous, green to red-brown, fusiform, gradually tapered to truncate base, abruptly contracted to a beak; beaks 0.5 – 1.0 mm long, 0.1 – 0.2 of perigynium length, smooth, slightly excurved, entire. Achenes 2.8 – 3.4 mm long, 1.4 – 1.6 mm wide, obtusely trigonous with faces slightly concave to flat, tightly enveloped by perigynia, brown, obovate, basally abruptly narrowed to stipe 0.3 – 0.4 mm long, apically abruptly narrowed to beak 0.2 – 0.3 mm long; body 2.2 – 2.9 mm long; beak bent 10 – 90° from vertical. Styles slender, jointed with achenes, withering; stigmas 3, 2.4 – 3.6 mm long. Anthers 3, (2.1) 2.5 – 2.8 mm long.

TYPE: MÉXICO. TAMAULIPAS: Mpio. Gómez Farías, vicinity of Rancho del Cielo Biological Station ca. 7 km WNW of Gómez Farías, along forest trail from old lumber road to the lumber road to Indian Springs (Ojo de Agua de los Indios), cloud forest of *Quercus, Liquidambar, Acer, Magnolia*, and *Podocarpus*, NE-facing, rocky, moist slope, 1200 m, frequent in one local area, 1 Jun 1989, *Naczi 2220 & Reznicek* (HOLOTYPE: MICH; ISOTYPES: BM, CHAPA, ctb - Charles T. Bryson personal herbarium, F, GH, MEXU, MO, NY, PH, SMU, TAES, TEX, US, VDB, WIS).

Additional specimens examined. MÉXICO. TAMAULIPAS: near Frank Harrison's "Rancho del Cielo" in Sierra de Guatemala above Gómez Farías, trail to Ojo de los Indios, 4500 ft, 27 Aug 1952, *Sharp et al. 52103* (MSC, TENN); "North Woods" off the Joya de Salas trail, 4600 ft, 1 Sep 1952, *Sharp et al. 52232 and 52248* (MSC, TENN); Mpio. Gómez Farías, vicinity of Rancho del Cielo Biological Station ca. 7 km WNW of Gómez Farías, along logging road from Indian Springs (Ojo de Agua de los Indios) to Agua Linda turnoff, moist cloud forest of *Quercus, Liquidambar, Acer*, and *Podocarpus*, 1400 m, frequent in bed of old logging road and along forest edge in old clearing, 1 Jun 1989, *Naczi 2221 & Reznicek* (CHAPA, ctb, MICH, NCU); NE of Indian Springs (Ojo de Agua de los Indios) toward Agua Linda, edge of sunny, open clearing between low ridges in open Pinus forest, 1500 m, few scattered clumps, 1 Jun 1989, *Naczi 2222 & Reznicek* (CHAPA, MICH).

The numerous (50 – 61) nerves impressed in the mature, dried perigynia of *Carex asynchrona* clearly place this species in section *Griseae*. Within section *Griseae*, *C. asynchrona* belongs to a group of species possessing tight leaf and bract sheaths and perigynia tightly enveloping the achenes. The other species in this group are *C. hitchcockiana* Dewey, *C. impressinervia* Bryson, Kral, & Manhart, *C. oligocarpa* Willdenow, and *C. ouachitana* Kral, Manhart, & Bryson. The purple-red bases and distichous perigynia of *C. oligocarpa* and the purple-red bases and stout, long-creeping rhizomes of *C. ouachitana* easily distinguish each of these species from *C. asynchrona*.

Although *C. hitchcockiana* has brown bases and perigynia with definite, excurved beaks like *C. asynchrona*, *C. hitchcockiana* has pubescent leaf and bract sheaths, wider leaf blades (widest leaf blade per plant 3.0 – 6.3 mm vs. 2.5 – 4.0 mm wide), longer bract blades (bract blade of uppermost lateral spike (1.8) 4.5 – 15.3 cm vs. 0.4 – 4.0 cm long), and longer perigynia ((3.9) 4.2 – 5.7 mm vs. (3.6) 4.0 – 4.7 mm long) than *C. asynchrona*. *Carex impressinervia* has brown bases and fibrous remains of old leaves at its culm bases like *C. asynchrona*, but the former usually has non-overlapping upper spikes, much longer terminal spike peduncles ((5) 19 – 66 (89) mm vs. 2.4 – 10.8 (14.8) mm long) and less definitely beaked, more remote perigynia (the lowest 2 perigynia of the lowest spike usually non-overlapping and 4.2 – 17 mm distant vs. usually overlapping and only 1.9 – 3.7 (5.9) mm distant) than *C. asynchrona*. The following key will aid in distinguishing *C. asynchrona* from its close relatives.

1. Cataphylls and basal leaf sheaths purple-red.
   2. Densely cespitose, rhizomes very short; bract of uppermost lateral spike usually exceeding terminal spike; terminal spike 1.2 – 3.0 mm wide. . . . . *C. oligocarpa*
   2. Loosely cespitose, rhizomes long-creeping; bract of uppermost lateral spike usually much shorter than terminal spike; terminal spike 2.8 – 4.5 (5.4) mm wide. . . . . *C. ouachitana*
1. Cataphylls and basal leaf sheaths brownish.
   3. Leaf and bract sheaths pubescent; bract blade of uppermost lateral spike (1.8) 4.5 – 15.3 cm long; widest leaf blade 3.0 – 6.3 mm wide. *C. hitchcockiana*
   3. Leaf and bract sheaths glabrous; bract blade of uppermost lateral spike 0.2 – 6.8 cm long; widest leaf blade 2.5 – 4.0 mm wide.
      4. Upper 3 – 4 spikes overlapping; terminal spike peduncle 2.4 – 10.8 (14.8) mm long; lowest 2 perigynia of lowest spike 1.9 – 3.7 (5.9) mm distant. . . . . *C. asynchrona*
      4. Upper spikes usually nonoverlapping; terminal spike peduncle (5.0) 19 – 66 (89) mm long; lowest 2 perigynia of lowest spike 4.2 – 17 mm distant . . . . . *C. impressinervia*

Carex asynchrona is locally frequent at 1200 – 1500 meters (4000 – 5000 feet) elevation in the vicinity of the Rancho del Cielo Biological Station. It inhabits heavily to lightly shaded, moist loam of forests and forest edges at the upper elevational limit of cloud forest. Unlike the temperate members of section *Griseae*, culm development within an individual of *C. asynchrona* is staggered. Several specimens possess culms with flowers at anthesis as well as culms shedding mature perigynia, hence the epithet "asynchrona." Peak fruiting appears to occur in late May-June, with one fruiting culm (*Sharp et al. 52248*, MSC) among otherwise sterile material collected in late August and early September (*Sharp et al. 52103*

(MSC, TENN), *52232* (MSC, TENN), and *52248* (TENN)) indicating that fruiting occurs sporadically at other times of the year.

Carex asynchrona joins other recently described species of section *Griseae* (Bryson et al. 1987; Kral et al. 1987) in increasing the membership of this taxonomically complex and poorly resolved group (Naczi, revision in preparation). That a species of a section most diverse in the southeastern United States would occur disjunctly in southwestern Tamaulipas is not a total surprise. The community of which *C. asynchrona* is a member exhibits much floristic affinity with forests of the southeastern United States. Genera of forest trees and shrubs with the same or closely related species in both the Gómez Farías area and the southeastern United States include *Acer, Carpinus, Carya, Cercis, Fagus, Hamamelis, Illicium, Liquidambar, Magnolia, Morus*, and *Tilia*. As well, closely related or conspecific members of such herbaceous genera as *Arisaema, Botrychium, Epifagus, Laportea, Mitchella, Sanicula*, and *Viola* occur in the forests of both regions (Hernández X. et al. 1951; Martin and Harrell 1957; Rzedowski 1978).

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